

AIRPORTS AND HARBOURS: DRIVERS OF URBAN DEVELOPMENT IN THE 21st CENTURY?

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ABSTRACT

This paper explores the potential role and the impact of airports and harbours on urban development in the 21st Century. Today the aviation and shipping industries mean wealth and prosperity as millions of passengers and freight or cargo arrive and depart at airports and harbours. This paper also highlights the challenges likely to be faced by local authorities, planners and urban practitioners.

PREAMBLE

Airports and harbors form part of an international global network that facilitate international trade and economic growth. The global networking is further being promoted by competitive international alliances and agreements such as the “open skies” and “open gates” policies in the aviation and shipping industries respectively. Modern airports and ports form a global system of central places where their position in the hierarchy is determined both by the connectivity within the industry and by the specialized function of the facilities. The rapid rate of development in these sectors should be seen as a reflection of economic strength in the expanding service sector of the economy.

As the volume of passengers and the choice of destinations have increased, so has the realization that ports and harbors have to provide more than a place to wait for arrival or departure. Convenience, efficiency and mobility have become key factors in the design of these facilities.

Global commerce is flourishing and the demand for ports and airport services has

increased dramatically. The growing volume of passengers and freight is putting immense strain on airports, ports and the inland supporting systems and infrastructure.

INTRODUCTION

Today the shipping and aviation industries mean jobs, income and prosperity. In addition these sectors have brought wealth, new travel and tourism opportunities. The aviation and shipping industries are now a massive and economically vital business.

Airports, harbours and the inland systems provide instant access to a global trading network and the potential for interaction in the international markets.

Furthermore, airports and harbors are increasingly being characterized as large-scale development projects known as *Urban Mega Projects*. These projects are usually associated with globalization of property markets, high technology, manufacturing and the rise of transnational firms including professional organizations. Urban Mega Projects developed on harbors and airports are seen as functional nodes in far reaching

development corridors that facilitate the movement of people, goods and services.

Even though these facilities have a huge impact on economic growth, their impact on the surrounding environment is increasingly being described as hostile. Internationally, a lot of concerns are being raised regarding the management and ownership of the facilities. It is increasingly being pointed out that the scope of their operations and the benefits received by local authorities usually do not outweigh the cost borne by local authorities for hosting these facilities.

Modern airports and ports are often a dominant land use in the areas they are located in and, therefore, have significant implications for physical and environmental features of the city. Their growth and expansion sometimes comes at the expense of land uses that are important to the community.

This paper attempts to explore the potential role and the impact of airports and harbours on urban development. Both urban planning and infrastructure planning are operating in a context of rapid rate of change. The paper also highlights the challenges likely to be faced by local authorities, planners and urban practitioners.

URBAN DEVELOPMENT IN THE 21st CENTURY

Urban development in the 21st Century is likely to see an intensification of trends experienced in the 20th Century. At the same time, there is going to be a number of contradictory developments emerging as cities attempt to remedy some of the consequential effects of this era. According to Albrechts (1999), urban planning in the 21st Century will have to be proactive, collaborative, integrative in its approach, international in its orientation; political in its attitude towards power structures; normative in its search for solutions, and entrepreneurial in its scope. Urban planning, will be more encompassing and including the following approaches:

Decentralization

The fundamental urban trend of the 20th Century was largely decentralization of people, goods, services and jobs from the inner city to the less dense suburbs and from larger cities to smaller developments. Speculative development driven largely by the private sector has resulted in leapfrog developments on valuable agricultural land on the periphery of cities. For this reason, most cities have attempted to plan for future development and have developed mechanisms for reinforcing the plans to promote densification, infill, recycling of brownfield land and containing urban sprawl. Considerable planning in most cities has been undertaken with very little implementation. Furthermore, in every city, there is a major complication – that of urban space being scarce and expensive.

In the context of growing environmental concerns, decentralization is seen to be contradictory to the basic principles of sustainability because it generates more trips and uses more resources than the more compact city form. This form of urban development emphasizes densification and infill and recycling of the brown-field land as opposed to new green-field development; living and working should not be separated and where necessary further decentralization should be avoided (Hall & Pfeiffer 2000).

Centralization and Reconcentration

A compact urban form is also likely to evolve from the forces of centralization and reconcentration which results in some of the urban functions and activities to gravitate towards each other more tightly than ever. Centralization is likely to force the activities concentrating in nodes developed around transport interchanges which are located in the redeveloped older parts of the city, along development corridors, new stations and rail corridors (Hall & Pfeiffer 2000).

The five elements used by Lynch (1960) in the “Urban City Form” would be in operation. These include landmarks, nodes, path districts (corridors) and edges. Corridors are not an innovation by planners; they are a market

response to the need for mobility due to the increase in private car use and ownership. Carefully planned corridors should be able to provide opportunities and facilities present in the multi-centered cities and nodes (Green 2000).

Collaborative Approaches

According to the recent work undertaken in the USA and UK, solutions to urban development in the 21st Century will be driven not by a single approach but an optimum combination of policies. This approach is called a Portfolio Approach. This approach is characterized by medium density urban brownfield redevelopment with a mix of land use along and around transport interchanges and public transport routes combined with some greenfield developments. The ultimate development is a polycentric concentrated city form which allows the city to progressively grow with a large degree of self containment in a highly networked environment through efficient public transport (Hall & Pfeiffer 2000).

Another new urban planning ethic for the 21st Century, which has been adopted in the redevelopment of inner cities in Rotterdam and Barcelona, is the WIMBY (Welcome into My Back Yard). The approach is used to improve the competitive position with respect to the spatial division of consumption in order to encourage the private sector to invest in the inner city. This is opposed to the NIMBY ideology where the planning system was considered to be the only device for fending off unwelcome development by big business that required more infrastructure planning and greater certainty about its operating environment. In the new approach, the city is no longer judged by the extent to which it fulfils the preconceived desires, expectations and norms, but by the opportunities it presents for renewal and integration arising from development programs.

Urban planning also takes a fundamentally different approach, as every project is likely to be dominated by the interaction with the existing infrastructure, communities, and organizational structures. Furthermore, the primary issue is no longer on where to locate

things in relation to the neighborhood. The challenge is to practice urban planning without a prescriptive model of the qualities of a good urban form. The quality of urban development depends on how planners seize the physical infrastructure, economic and cultural opportunities that are already present and mould them into something new.

In most cities, such opportunities are likely to be concentrated around airports and harbors. Their location as nodes in the infrastructure network makes them outstanding places to establish functions that attract many people. The challenge is for cities to transform these facilities into attractive places for people to live work and relax. Urban planning, especially spatial planning, around airports and harbors is of a special nature and is often less interwoven with the rest of the communities.

Unfortunately, in terms of city marketing, in the strategic sense of the word, very little focus is directed to the future role of airport and ports. Yet it is the development of such infrastructure that supports expanding parts of the economy and provides instant access to a global trading network and the potential interaction of in the international network and market.

TRENDS IN INFRASTRUCTURE PLANNING

International trends in both the aviation and shipping industries have moved toward the concept of hub and spoke development strategy and the use of new large aircrafts and big shipliners. The use of new large aircrafts and large ships is resulting in the reduction of the number of new facilities and the concentration of services in strategically located hubs. The use of large carriers results in high yield economies of scale from the amount of passengers and cargo and the land side operations needed to load and offload. The influx of cargo from such carriers also requires efficient road and rail links to and from ports and airports.

As more carriers are consolidating their operations, port and airport authorities are

competing to retain their hub facilities as they position themselves to handle the new generation of trade.

The effects of such developments and trends affects areas far beyond these facilities since airports and ports are integral parts of the national transportation network.

These trends are forcing infrastructure planning to go through a product cycle in which the planning function is being separated from the service - production function. The public sector is withdrawing from service-production responsibilities to concentrate on strategic planning and regulatory systems and thus transferring management functions to private companies and parastatal entities.

ROLE OF AIRPORTS AND HARBOURS

The roles of these facilities are wide ranging. As both are providers of infrastructure for exports and imports, and commercial entities in their own right, they make a significant contribution to regional and national economic growth in terms of activities and job creation.

IMPACTS

Impact on Economic Growth and Development

The current rapid development in air transportation and the shipping industry should be seen as a reflection economic strength in the rising service economy. Most of the modern commercial airports and ports are increasingly forming a global system of central places where the position in the hierarchy is determined both by the connectivity within the industries and specialization of their developments.

According to the International Air Transport Association (IATA), air traffic worldwide is growing by an average of 5% per annum. Current trends suggest that by 2005, this growth may double. Furthermore, in 1989, the aviation industry had provided at least 21 million jobs for the world's workforce, and \$700 billion in gross output (IATAG 2001).

Ports and airports are economic generators with long-term community benefits because they play a significant role in generating and sustaining local, national and international economies. Furthermore, these facilities are self-supporting public/private enterprises which are structured to deliver excellence in service and are committed to satisfying the evolving needs of their communities, tenants and users. In most cases they are cost effective enterprises because the costs are closely monitored, managed and maintained in accordance with market demands and government requirements.

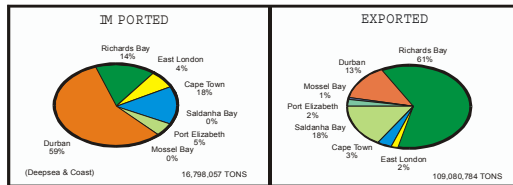
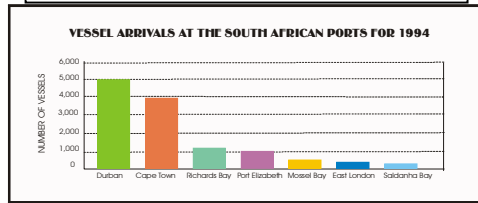
The economic impact of ports and airports ranges from

- *Direct Impact:* These are impacts relating to expenditures by the port/ airport and the tenants who provide services at the ports and airports.
- *Indirect Impacts:* These are expenditures related to airport activity, generated away from the airport. These include hotels, ground transportation, travel agencies etc.
- *Induced Impacts:* These are impacts from the subsequent spending by the community.
- *Multiplier effects:* Resulting from additional jobs, earnings and economic impact from direct and indirect expenditures.
- *Other non-quantifiable benefits:* These relate to other health, welfare, and safety benefits.

In terms of cargo, 95 % of South Africa's international trade is by sea. Portnet, a transport utility under Transnet, operates all the international ports.

A comparison of the number of vessels arriving at South African ports and the amount of cargo handled in 1994 and the amount of activity from each port are shown in the diagrams below.

CARGO HANDLED BY SOUTH AFRICAN PORTS DURING 1994



Source: Port of Durban Information Report

Airports on the other hand as an important for international trade, although the volumes of cargo are low compared to ports, the growth outlook is similar. Air cargo carriers do attract high volumes of high value, sensitive goods, which includes electronics, e-commerce, small parcels and express deliveries.

The large volumes mean more demand for space and movement, particularly in the trade corridors - for distribution centers, cargo handling and storage facilities.

Job Creation and Employment

It is estimated that for every million passengers who pass through an airport, between 1000 and 1500 jobs are generated. Over half of these jobs depend on airline companies. As the airports become busier the more jobs are created. Paris – Charles De Gualle employs more than 50,000 people, Melbourne, 10,000, Barcelona- airport activities generate 70,000 jobs, Sydney generates 10 000 jobs.

Within a 10 kilometer radius of an airport, there are secondary and tertiary activities for which the proximity to the airport is of vital importance.

Retail and Property Development

In addition to benefits derived from aeronautical operations, airports are expanding the non-aeronautical operations in the form of property and retail development.

Airports are becoming more and more like shopping centers. Retail development is seen as the main engine of future growth earnings at airports. For South Africa airports, just like Portnet, the Airports Company South Africa (ACSA) controls all the international airports in South Africa. ACSA has put in place a program for the development of retail space at international airports in order to create world class shopping environments. It has approximately 3000 ha of undeveloped land that is not required for aviation uses. In terms of its vision, this land will be used for greenfield developments for many years to come. In developing the land ACSA will form partnerships with other organizations (ACSA Annual Report 2000).

Open Skies, Liberalization and Open Gates Policies

Business alliances are vital driving forces in the links for international markets. Open skies agreements aim at promoting competition and injection of capital investment in the international aviation market. Airlines must compete aggressively on international routes. The rapid growth in airline industry has been promoted by expanding global alliances as well as the open skies policy and liberalization. Liberalization encourages free market and entry of new carriers on the international airline market. This policy is being strengthened by the adoption of the hub and spoke development strategy in airport development. In most cases the impacts of these policies have resulted in more improved services especially on feeder routes and destination airports.

Similarly, the shipping industry is adopting the open gates policy and promotion of hub ports.

Tourism greatly benefits from these policies because it results in increased international competition, more international connected flights and low fares. However, in terms of domestic flights and the rest of southern Africa, fares still remain high because the policies do not apply to domestic situations.

PROVISION OF INFRASTRUCTURE NEEDS

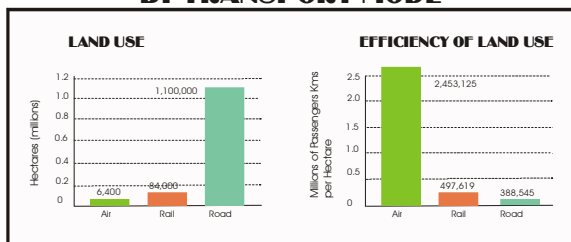
In today's rapidly changing global economy, airports and harbors are a vital link in the world's transportation network. Many land-locked countries rely on the rail network and their strong link to ports for exports and imports of goods.

The expansion or improvement of the rail service and road infrastructure thus reducing the need for new facilities can increase the capacity of an airport or a port. A strong rail and road network is necessary to transport goods to and from land-locked countries.

IMPACT ON LAND USE

The amount of land dedicated to either aviation or ports in most cases is minimal compared to the requirements of road and rail infrastructure. In terms of people, goods and services moved, and the amount of investment, airports use land five times more efficiently than rail and six times more than roads. These findings were confirmed through studies undertaken in Germany and a further study reported in the Lufthansa Yearbook in 1989. The relative land use by transport mode and the number of kilometers covered per hectare is shown below:

RELATIVE LAND USE IN THE FRG BY TRANSPORT MODE



Source: IATA Action Group 20001

The change in land use from primary port or airport functions to commercial activities also encourages the efficient use of scarce urban land.

IMPACT ON CITY STRUCTURE

Ports and airports are linked to major city centers largely by rail and road and are often located in prime locations in proximity to central business districts. As functional nodes within the urban system, these facilities are substantial building blocks in the urban

network. Barcelona is a classic example of how the airport and the harbor are structuring the city structure. The Port of Barcelona is the biggest port in the Mediterranean, with natural hinterland of more than 20 million inhabitants.



Source: Barcelona New Projects 1999.

As the facilities are expanded, they attract more development and population in the surrounding areas. The twin roles as a major transport interchange and business node are mutually reinforcing, as good access to both domestic and international markets attracts on-going concentration of export and import oriented activities.

Integration of ports and /or airports with the rest of the city is often promoted by developments in their proximity. These facilities provide opportunities for recycling land and old infrastructure for commercial, retail and tourism. Such a development can be illustrated by the Victoria and Alfred Waterfront in Cape Town, which continues to be one of the top tourist attractions in the country drawing in over 18 million visitors per annum. Its success has transformed the once neglected historic harbor by reintegrating the port area into the city fabric and creating a vital facility for mixed development.

Victoria & Alfred Waterfront – Cape Town



Source: *Port of Cape Town Handbook*

The adoption of the hub and spoke development strategy for airports is facilitating the move to upgrading of existing airport facilities. This provides an opportunity for recycling of urban brownfield land by concentrating services and commercial activities. Airports and harbours are becoming more and more like shopping centers and enterprise zones, as more and more businesses which depend on these facilities for their livelihood, access to markets and access to the national and international transportation system locate in their vicinity.

The rapid technological change in air and water transportation has also contributed to the polarization between the core and peripheral of the city, as more and more businesses that depend on access to the international and national markets locate at and in the vicinity of the port and airport facilities.

IMPACT ON THE ENVIRONMENT

Despite the strong economic benefits in air and shipping industry, these facilities bring increases in noise and environmental pollution.

Harbors and airports are always characterized as hostile environments, fenced off for security, hard surfaced for easy cargo handling, noisy, dusty and involve potentially environmental damaging activities.

The planning, design, construction and operation/ maintenance of ports and harbors can have a variety of impacts on the

environment. The impacts range from the destruction of natural vegetation and wildlife, to erosion, pollution etc. The connecting rail and road network often creates barriers, exacerbating the nature of separation between the surrounding areas and the infrastructure.

Noise and pollution can represent a significant negative impact on human and wildlife, health and social welfare. People living around airports often feel that air transport is a strain on the local environment particularly with respect to noise.

Noise is emerging as a major constraint to the growth of the aviation industry. As a result, noise concerns are receiving more regulatory and technological attention than any other aviation environmental problem (IATA 2001).

In the aviation industry, noise regulations were initially implemented in 1969 in the USA and the International Chicago Convention (ICAO) established international certification standards for commercial jets in 1971. The phasing out of noisy aircraft has resulted in significant reduction of the number of people affected. In the 1960s, on take off, the Boeing 727 created an intrusive footprint of noise covering more than 14 square kilometers. Modern aircraft of similar capacity but with greater take off power creates a noise footprint of only 1.5 square kilometers (IATA 2001)

Further improvements in the noise impact will require a combination of measures including changes in operating procedures and better land use planning

In terms of air pollution, modern aircraft are quieter and more efficient in fuel consumption. Improvement in technology has substantially reduced aircraft engine emission (ICAO 2000).

IMPACT OF STATE- OWNED AND PRIVATIZED MANAGEMENT ON LOCAL AUTHORITIES

Infrastructure and services are the basic input into urban development; however, local authorities often do not have adequate sources

of funding to provide infrastructure of high quality.

The weakened financial position of municipalities forces them to cooperate with the private sector and other public bodies through negotiations and agreements.

Concerns from local authorities focus on the question whether the benefits received from these facilities outweigh the costs incurred in the responsibility of being the host.

Authorities are not allowed to levy approved local taxes against the developments in the terminals of these facilities. It is assumed that the financial resources have been available to develop and sustain operations of the facilities that would eventually result in substantial employment and wage benefits for the residents in communities in the surrounding areas.

Even though the local authority receives employment, tax revenue and business development benefits from the operation of the facilities, in the long term, this assumption is flawed because in most of the cases the development of the facilities is limited by the fact that surrounding areas might be fully developed. In cases of airport developments, the impact of noise on the surrounding environment is one of the major concerns limiting further development. For harbors, depending on its function, the pollution and contamination of the surrounding environment is also of major concern.

CHALLENGES

The rapid growth and demand for airport and harbour facilities has prompted the need for port and airport authorities to engage with host cities and communities in order to reconcile the implications of the impacts of the facilities. It is increasingly being acknowledged that there is a need for the integration of planning processes in order to promote strong working relationships. There are a considerable number of challenges that need to be mentioned, namely:

Urban Planning: Very little focus is being directed to the future role of the airline and airport services, ports and the shipping industry in South Africa. Yet it is the development of such infrastructure that is supporting the economy and often determines the long-term comparative advantages of countries and cities. Further challenges in urban planning arise around the design and integration of the facilities with the rest of the city. In South African cities, the sense of occasion related to arriving and departing is often absent. The arriving passengers are denied the experience of the warmth of South Africa as a gateway to Africa because of poor designs. In terms of airports, the international airports are of a linear concept where the terminal buildings run parallel along the length of the runway. One wonders what the implications of this approach will be as the number of passengers and cargo increases.

Furthermore, in terms of planning horizons, there is a major problem in reconciling long-term goals and short-term needs of these industries. There is a need for on going dialogue between planners and the port and airport authorities in order to strive toward a win-win situation. The situation is made worse by the lack of expertise within the transport planning departments who deal with freight related planning. Cargo movement is not yet a pressing issue, while the planning for movement of goods in cities is becoming more serious.

Congestion: The increase in the volume of passengers and cargo means more demand for movement and mobility on the roads, rail, and even at the terminal facilities themselves.

Should planners consider provision of freight or cargo expressways linking ports and airports, in order to aid the flow of goods and ease congestion? Is it possible to segregate goods traffic within the existing corridors?

Competition: Competition arises from existing and proposed ports and airports and international agreements such as the open skies and open gates policies.

Another area of competition arises when there is change in land use in the surrounding areas. When the facility is located in areas where the character of land uses begins to change to commercial, office development or housing then the facility becomes more of an “unwanted child.”

Restricted hinterland: External development pressures inhibits expansion growth and improved access to ports and airports. These facilities are often surrounded by heavily urbanized development that makes the expansion of the existing facilities difficult. Furthermore the development in the surrounding areas is often fragmented.

The challenge is to identify location for sites for intermodal terminal for cargo handling centers where different modes of transport hand off the cargo to each other or the ports and airports. There is a lack of intermodal type of transportation infrastructure either on the terminal sites or the surrounding areas.

Lack of infrastructure to handle future demand: The ports and airports should always have the capacity to accommodate new levels of demand. High realization costs and the general status of crisis in public investment contribute to difficulties in obtaining finance, environmental constraints, and particularly noise pollution.

The challenge is how to develop infrastructure capable of accommodating more freight and passengers without encroaching on local communities.

The freight industry is market driven and has a global, not a regional perspective, because it supports international supply chains. The cargo shippers want a seamless transportation system to move their goods. Usually more than one mode is used.

Pollution and Impact: The operations of modern airports and harbours are often dusty, noisy and busy all night. The increase in traffic raises problems in environmental and safety concerns. Noise and air pollution is a growing concern at local environments

The link between prosperity and these facilities is sometimes difficult to justify. In this respect airports and harbors need help in communicating their value to the community and the public in concrete and quantifiable terms.

Responsibilities: Should airports and harbors be developed as local initiatives instead of national and privately owned enterprises? Should concessions continue to be private and national concerns because of market competition as well as globalization? Should there be a national infrastructure policy for planning, managing and operation of these infrastructures?

Funding: if the above was possible, who would be responsible for funding the infrastructure. When one looks at dedicated freight or cargo mobility, there are issues in terms of costs that were not considered in the planning of freeways or rail. At this point public goals for transit coincide with private goals.

Lack of Legislative Framework: Where there is little private sector interest in funding for infrastructure and no mechanisms or incentive for collaboration, can legislation fill the gap between public and private interests? The current legislation framework is not stringent enough because it does not take into account the nuances of airports and ports on local planning.

CONCLUSION

Airports and harbors are experiencing rapid rates of growth as the number of passengers and amount of cargo have increased. The demand for these facilities has resulted in job creation, economic growth and prosperity. However, the impact of this growth has implications for economic development and tourism, city structure, urban land use, infrastructure needs and the local government.

Furthermore, the link between prosperity and the impacts is sometimes difficult to justify. There is a need for formation of partnerships between local authorities and operators whether it's the state or private entities in

order to achieve a better understanding of the potential and the role of airports and harbors in urban development in the 21st Century.

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